جمهورية مصر العربية

وزارة التربية والتعليم
والتعليم الفني

نموذج إجابة

امتحان شهادة إتمام الدراسة الثانوية العامة

للعام الدراسى ٢٠١٦/٢٠١٧ - الدور الأول

المادة : الديناميكا (باللغة الفرنسية)

نموذج

أ

من : الى	الدرجة
١ ← ٥	٧
٦ ← ٨	٦
٩ ← ١٢	٧
١٣ ← ١٦	٥
١٧ ← ١٨	٥
المجموع	٣٠ درجة

لكل مجموعة اسئلة مقدر
ومراجع

1-

(d) $2\sqrt{r}$ (1)

2-

(b) 2 (1)

3-

(i) $\because v = 6t - t^2$

$\therefore a = \frac{dv}{dt} = 6 - 2t$ (1/2)

quand $t = 2$, alors $a = 6 - 4 = 2 \text{ m/Sec}^2$ (1/2)

(ii) $D = \int v\,dt$

$D = \int (6t - t^2)\,dt$ (1/2)

$= 3t^2 - \frac{1}{3}t^3 + C$ (1/2)

quand $t = 0$, $D = 0$

$0 = 0 - 0 + C \Rightarrow (C = 0)$ (1/2)

$\therefore D = 3t^2 - \frac{1}{3}t^3$

$D_{t=2} = 3 \times 2^2 - \frac{1}{3} \times 2^3$

$= 12 - \frac{8}{3} = \frac{28}{3}$ mètre (1/2)

$\simeq 7,3$ mètres

(ii) autre Solution $D = \int_0^2 (6t - t^2)\,dt = \left[3t^2 - \frac{t^3}{3}\right]_0^2 = 3 \times 2^2 - \frac{2^3}{3} = \frac{28}{3}$m (1/2) (1/2) (1/2) (1/2)

4-

(c) 30000 kg.m/sec ١

5-

(b) 7,68 ١

6-

(C) accélération 1,2 m/sec vers le haut (1)

7-

premièrement dans l'air

$V^2 = V_0^2 + 2gD$ (1/2)

$V^2 = 2 \times 9,8 \times 1,4 \Rightarrow V^2 = 27,44$ (1/2)

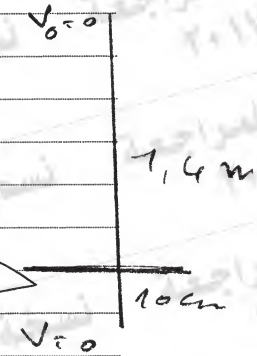
B

Deuxièmement dans le sable

$V^2 = V_0^2 + 2aD$

$0 = 2 \times 9,8 \times 1,4 + 2 \times a \times 0,1$

$\therefore a = -137,2 \text{ m/sec}^2$ (1/2)



$Mg - T = Ma$ (1/2)

$9,8M - 225 \times 9,8 = M \times (-137,2)$

$\therefore 147M = 225 \times 9,8$

$M = 15 \text{ kg}$ (1/2)

autre solution $E - E_0 = T$ (1/2)

$Mgd_1 + (Mg - T)d_2 = 0$ (1/2)

$\therefore Mg(d_1 + d_2) = Td_2$

$M = \frac{Td_2}{g(d_1 + d_2)}$ (1/2) $\Rightarrow M = \frac{225 \times 9,8 \times 0,1}{9,8 \times 1,5}$

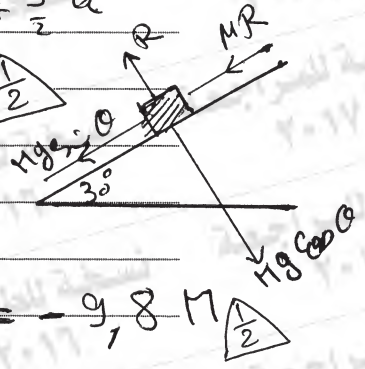
$M = 15 \text{ kg}$. (1/2)

8-

Premièrement : $V = V_0 + at$

$0 = 14,7 + \frac{3}{2} a$

$\therefore a = -9,8 \ m/sec^2$ (1/2)



$\therefore -R = Mg \cos 30°$ (1/2)

$-\mu R - Mg \sin 30 = Ma$

$\therefore -\mu Mg \cos 30° - Mg \sin 30° = -9,8 M$ (1/2)

$-\frac{\sqrt{3}}{2}\mu - \frac{1}{2} = -1$

$\mu = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$ (1/2)

Deuxièmement : $\therefore tgn\ \lambda = \frac{\sqrt{3}}{3}$ (1/2)

où λ est l'angle du frottement

$\lambda = \theta = 30°$ (1/2)

$\therefore$ le corps est sur le point de se mouvoir

9-

(d) 10^5 Newton (1)

10-

(a) $M_1 g - T = M_1 a$ ($\frac{1}{2}$) ... (1)

$T - M_2 g = M_2 a$ ($\frac{1}{2}$) ... (2)

par addition (1) et (2)

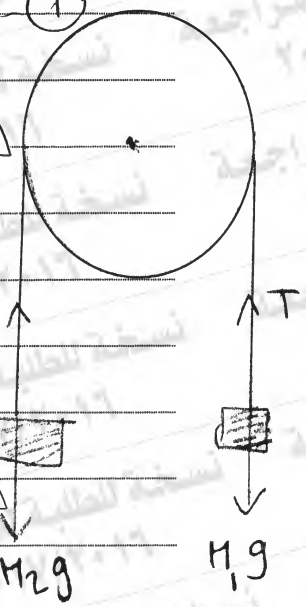
$M_1 g - M_2 g = (M_1 + M_2) a$ ($\frac{1}{2}$)

$980 (M_1 - M_2) = 196 (M_1 + M_2)$ ($\frac{1}{2}$)

$5 M_1 - 5 M_2 = M_1 + M_2$ ($\frac{1}{2}$)

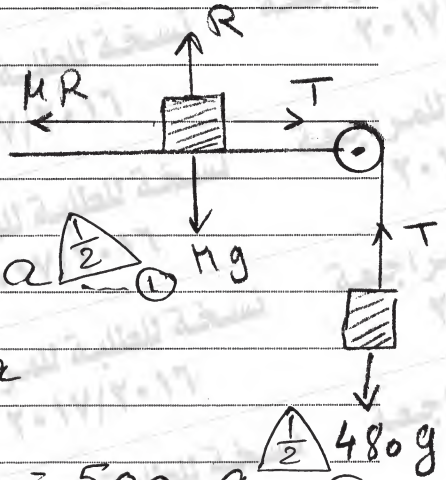
$\therefore 4 M_1 = 6 M_2$

$\therefore M_1 : M_2 = 3 : 2$ ($\frac{1}{2}$)



(b) $R = Mg$

$\therefore R = 500 \times 980$



$480g - T = 480\,a$ ...① ½

$T - \mu R = 500\,a$

$\therefore T - \frac{2}{5} \times 500 \times 980 = 500\,a$ ...② ½

par addition ① et ②

$480 \times 980 - 200 \times 980 = 980\,a$

$\therefore a = 280\ cm/sec^2$ ½

de ① $T = 480 \times 980 - 480 \times 280$

$= 336000$ dyne ½

$\therefore P = 2T \cos 45^\circ$ ½

$= 2 \times 336000 \times \frac{\sqrt{2}}{2}$

$= 336000\sqrt{2}$ dyn.

$= 3{,}36\sqrt{2}$ Newton ½

11-

(a) 45 m/s (1)

12-

$M_1V_1 + M_2V_2 = M_1V_1' + M_2V_2'$ (1/2)

$100 \times 50 - 50 \times 30$ (50) → ← (100)

$= 100 \times V_1' + 50 \times 40$

$V_1' = 15$ cm/sec. (1/2)

$\therefore I = M_2(V_2' - V_2)$ (1/2)

$= 50(40+30)$

$= 3500$ gm.cm/sec. (1/2)

13-

(b) 105 (1)

14-

(a) $\frac{1}{64}$ (1)

15-

(c) 39 (1)

16-

$\overrightarrow{D} = \overrightarrow{AB} = \overrightarrow{B} - \overrightarrow{A}$ (1/2)

$= (3; 6) - (-1; 2)$

$= (4; 2)$ (1/2)

$T = f \cdot D$ (1/2)

$= (6; -3) \cdot (4; 2)$

$= 24 - 6 = 18$ Unité de travail (1/2)

17-

∴ la puissance = $f \cdot V$ (1/2)

$30 \times 75 = f \times 54 \times \frac{5}{18}$

$f = \frac{30 \times 75}{15} = 150$ kgp (1/2)

∴ la vitesse uniforme

∴ $R = f = 150$ kgp (1/2)

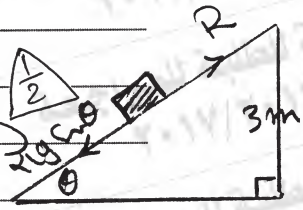
∴ la résistance pour chaque tonne

$= 150 \div 6 = 25$ kgp/tonne (1/2)

18-

(a) $\because E - E_0 = T$ ½

$\frac{1}{2} M V^2 - 0 = (Mg \sin\theta - R) D$ ½



$\therefore \frac{1}{2} \times 0{,}2 \times V^2 = 0{,}2 \times 9{,}8 \times \frac{3}{D} \times D - RD$ 1

$\therefore 0{,}1 V^2 = 0{,}6 \times 9{,}8 - 4{,}48$ ½

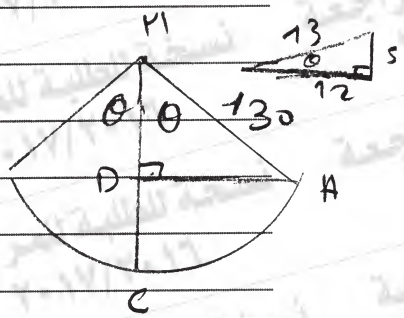
$V^2 = 14 \Rightarrow V = \sqrt{14}$ m/sec ½

(b) $MD = 130 \times \cos\theta$

$= 130 \times \frac{12}{13}$

$MD = 120$ cm ½

$\therefore DC = 10$ cm ½



$E_C + P_C = E_A + P_A$ ½

$0 + \frac{1}{2} M V^2 = 0 + Mg \times DC$ ½

$\frac{1}{2} V^2 = 980 \times 10$ ½

$V = 140$ cm/sec ½

(انتهت الإجابة وتراعى الحلول الأخرى)